

AMATEUR RADIO



Published in the interests of the Wireless Institute of Australia, Official Organ of all divisions of the W.I.A. and R.A.A.F.W.R.

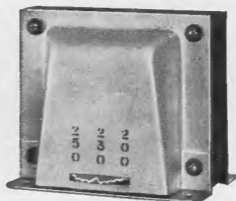


PRICE

6^D

FEBRUARY, 1940

TRANSFORMERS . . .



MANUFACTURED BY

TRIMAX TRANSFORMERS

(A DIVISION OF CLIFF & BUNTING PTY. LTD.)

Registered Office:

29-35 FLEMINGTON RD., NORTH MELBOURNE.

PHONE: F9127 (2 lines)

AMATEUR RADIO

Published in the Interests of Radio Amateurs and
Experimenters throughout Australia.

VOL. 8. No. 2.

1st FEBRUARY, 1940

OUR ORGANISATION

Publishers.—

WIRELESS INSTITUTE OF AUSTRALIA
(Victorian Division)
191 Queen Street, Melbourne, C.1.

Editorial Department.—

W. R. GRONOW (VK3WG),
Editor.

R. H. CUNNINGHAM (VK3ML)
Technical Editor.

C. SERLE (VK3RX)
Notes Editor.

V. E. MARSHALL (VK3UK)
Compilation.

H. N. STEVENS (VK3JO)
Distribution.

L. T. POWERS (VK3PS)
Secretary.

Advertising Department.—

BEDGGOOD ADVERTISING CO.,
129 William Street, Melbourne.
Phone: MU 4046

Sydney Representative—

J. H. FRASER

8 Deakin Avenue, Haberfield. UA 1725.

Printers.—

H. HEARNE & CO. PTY. LTD.,
285 Latrobe Street, Melbourne, C.1.

Accounts Department.—

LARGE & POWERS,
Chartered Accountants (Aust.),
422 Collins Street, Melbourne.

MSS and Magazine Correspondence
should be forwarded to The Editor,
"Amateur Radio," Box 2611W, G.P.O.,
Melbourne.

Subscription Rate is 6/- per annum in advance (post paid).

NOTE.—Advertisers' change of copy must be in hand not later than the 20th of the month preceding publication, otherwise the previous month's copy will be reprinted.

CONTENTS.

	Page
Editorial - - - - -	2
Modulated Oscillators for Receivers - - - - -	4
A Review of Radio Re- ceivers - - - - -	11
Putting the Vacuum Tube Voltmeter into Service	13
Federal and Victorian Q.S.L. Bureau - - - -	14
28-56 M.C. Notes - - - -	15
Divisional Notes - - - -	16
Correspondence Section -	24

IMPORTANT—

R.A.A.F. VACANCIES - 10

DIVISIONAL ADDRESSES.

FEDERAL HEADQUARTERS:
BOX 2611W, G.P.O., MELBOURNE

NEW SOUTH WALES:
BOX 1734JJ, G.P.O., SYDNEY.

VICTORIA:
BOX 2611W, G.P.O., MELBOURNE.

QUEENSLAND:
BOX 1524V, G.P.O., BRISBANE

SOUTH AUSTRALIA:
BOX 284D, G.P.O., ADELAIDE.

WESTERN AUSTRALIA:
BOX N.1002, G.P.O., PERTH.

TASMANIA:
BOX 547E, G.P.O., HOBART.



EDITORIAL



We have been requested by F.H.Q. to publish the terms of the application for re-allocation of licences. As already advised in January issue, this application was unsuccessful, and every effort is being made to have this decision reversed.

15th November, 1939.

The Chief Inspector, Wireless,
—Mr. J. M. Martin—
Radio Inspectors Branch,
Treasury Buildings,
Treasury Gardens,
Melbourne, C.I.

Dear Sir:

Re **EXPERIMENTAL LICENCEES
AND ULTRA HIGH FREQUENCY
ALLOCATIONS.**

On behalf of the Federal Council of the Wireless Institute of Australia, I beg to apply for allocation of portion of the undermentioned Ultra High Frequency Spectrum for transmission experiments to all Experimental Licencees throughout Australia.

The Wireless Institute represents approximately twelve hundred experimenters throughout the Commonwealth and we are also aware

that our application is heartily supported by numerous non-members of our organisation.

In asking that permission be given for the operation of Experimental Radio Stations, we would mention that much valuable knowledge has been and can be obtained from the continued study and operation of experimental transmission and receiving equipment. The suggested allocation is as follows:—2.5 meters (112 MC) and below, with a power of 25 watts. It is felt that these frequencies are of no value for service communications and would provide experimenters with an object for serious study. The allocation of these frequencies for experimental communication would also permit all licencees an opportunity for continued practice in "Morse" transmissions with a consequent effect on their value as radio operators in the service of the Commonwealth.

We would be prepared to make available suitable wave measuring equipment in each division, as required for the use of experimenters in locating these frequencies correctly; also we would undertake to extend the activities of the present Vigilance Committees in co-operation with the Postmaster-General's

Dept. to monitor these bands with a view to maintaining a close observance of the regulations.

It is hoped that you will agree to this request, as we feel it is essential to encourage the study and development of radio transmission on these frequencies, as the possession of a trained body of radio enthusiasts is of vital importance to the Country.

We would remind you that seven hundred Experimental Licences are now serving as Wireless Operators and Technicians with the various Services and have thus proved the value of their study and application of radio in a time of need.

Thanking you in anticipation of your agreement to this application.

I am,

Your faithfully,

(Signed) WILLIAM R. GRONOW,
Federal President,
Wireless Institute of Aust.

N.B.—Attached is a more detailed summary of our suggestions.

- (1) Transmission to be limited to 112 MC and frequencies above.
- (2) Maximum power input 25 watts.
- (3) Transmission to be limited to class A1, A2, A3 waves.
- (4) Licences to be re-issued on individual application only; the Department to with-hold issue if it is deemed advisable. This application is being presented subject to the above conditions, for the following reasons:—
 - (a) Frequencies of 112 MC and above are of no value to the Services, whilst frequencies, at least up to 60 MC will probably be utilised.
 - (b) By the opening of 112 MC and frequencies above, no interference to either service or commercial stations will be possible with such low power.
 - (c) The frequencies proposed are

useless for any form of illicit communication.

- (d) The re-instatement of experimental licences for operation on these frequencies will provide a very desirable incentive for men who have not yet enlisted to study for the Amateur Operators' Certificate of Proficiency, and thus provide the Commonwealth with a steady potential source of W/T operators, for the needs of the three Services. (As you are no doubt aware, the latter are being forced to train men without knowledge of Radio as W/T Operators, because practically all Amateurs who are eligible for enlistment have joined up). This does not mean, however, that the number of Experimental Licences likely to be re-applied for will be small, because not only are a considerable number of Amateurs engaged in Reserved occupations, but in addition, there are many both physically unfit and over age.
In addition, it can be considered as certain that the greater majority of those serving in the Forces would re-apply immediately).
- (e) The Wireless Institute of Aust. as the Officially recognised Amateur body in Australia is prepared to provide an adequate monitoring organisation not only of transmissions, but also of equipment in a manner and through an organisation approved by the Department.
- (f) The opening up of these frequencies (112 MC and above) requires a high degree of technical knowledge and skill for effective communication; thus the possibility of transmissions being made by unqualified and unlicensed persons may be considered as unlikely.

Modulated Oscillators for Receivers

By courtesy Amalgamated Wireless Valve Company Pty. Ltd.
(Continued from January Issue).

ALIGNING RECEIVERS.

The alignment of superheterodyne receivers is a fairly standardised procedure and does not involve any great difficulties provided certain precautions are taken. Final alignment should only be carried out after all voltages have been adjusted, and should preferably be the last operation on a chassis. It is not good practice to carefully align a receiver and then to disturb the wiring or subject the chassis and components to undue stresses.

As a general rule, the input voltage from the modulated oscillator should be kept small and alignment carried out with the gain control (or controls) of the receiver in the maximum position. The use of small input voltages is particularly important when dealing with a receiver equipped with A.V.C. since at higher signal inputs the A.V.C. becomes fully operative and changes in output level are greatly reduced by its action. Furthermore, the R.F. and I.F. amplifying valves have a certain input capacitance, which is effectively in parallel with the tuned grid circuit and varies with the gain of the stage. If the tuned circuits are aligned with a large input signal errors may occur on weak signals where the valves are operating under relatively higher gain conditions.

Some form of output meter (such as that incorporated in the Radiotron Volt-Ohm-Milliammeter) is almost essential when aligning receivers, as it is then possible to observe variations in output voltage which could not be detected by ear. If no out-

put meter is available, the power output should be kept to a low level, at which the ear is more sensitive to small variations in volume.

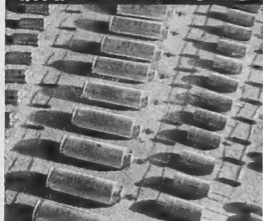
Aligning the I.F. Transformers.

To align the I.F. transformers, the output of the modulated oscillator must be fed into the signal grid of the frequency changer. For exact measurements of sensitivity, the normal grid cap should be removed and the D.C. return made through the output circuit of the modulated oscillator to the chassis, or to some appropriate point when the normal grid return is to a source of negative bias.

This is not always convenient and for purposes of alignment the normal grid cap may be left in position and the oscillator output connected between grid and chassis. A condenser of 0.001 μ F. capacitance connected in series with the "hot" lead will prevent any initial bias being "shorted out" by the modulated oscillator.

Unless there is a definite reason, it is not advisable to alter the intermediate frequency of an existing receiver. Many manufacturers do not adhere rigidly to 465 Kc/s and prefer to use some slightly different frequency. Unnecessary alteration of the I.F. in such receivers may lead to trouble with "joeys" and will upset dial tracking. The frequency of the modulated oscillator should be adjusted for greatest output from the receiver and then, without alteration of the frequency the settings of the individual trimmers should be checked. With new receivers this does not hold, and the I.F. trans-

CONDENSERS and RESISTORS



DUCON-CHANEX
GUARANTEE

*Complete
Reliability*

Under the most exacting
conditions.

Ducon Condensers are admirably
suited to withstand the peculiar
conditions of amateur and experi-
mental work.

In the new transmitting units of
2FC and 3LO, Ducon Condensers
were installed, being specially
chosen for their unique quality.

For all Condensers and Resistors
specify

DUCON CHANEX

73 BOURKE St. WATERLOO. N.S.W.
450 COLLINS St., MELBOURNE, C.I

formers may be aligned to the inter-
mediate-frequency for which the
coil kit is designed.

In cases where the I.F. trans-
formers have not been aligned, it
may be necessary to adjust the sec-
ond transformer (by feeding the
signal to the grid of the I.F. ampli-
fying valve) before any signal can be
obtained from the frequency
changer.

Tuning Circuits.

Alignment of the tuning circuits
presents little difficulty in the case of
receivers in which the dial is mark-
ed only in terms of an arbitrary scale.
The procedure usually adopted is
then as follows:—

The stations on the high-frequency
end of the band are set to a satis-
factory position by means of the
oscillator trimmer. Reducing the
capacitance of this trimmer will shift
the stations towards the centre of
the dial scale, while increasing it
will have the opposite effect. The
modulated oscillator is set to 1400
Kc/s and the output lead connected
to the aerial terminal in place of the
aerial. The signal is carefully tuned
in and the aerial and R.F. trimmers
adjusted for maximum output. The
modulated oscillator is now set to 600
Kc/s and, with the receiver tuned to
this frequency the padding con-
denser is adjusted to give maximum
output, the gang being "rocked" to
allow for alteration in oscillator fre-
quency. The optimum adjustment is
that when any variation in the pad-
der setting causes a falling off in out-
put, no matter which way the gang
condenser is turned. Having adjust-
ed the padder, it is necessary to re-
check the aerial and R.F. trimmers
at 1400 Kc/s.

Unless definitely necessary, the
setting of the oscillator trimmer in
a receiver should not be altered,
since any alteration is likely to be
very disconcerting to a client who
has carefully memorised the posi-

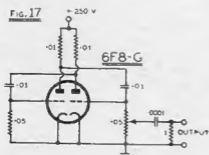
tions of the various stations on the dial. It is usually sufficient to check the adjustment of aerial and R.F. trimmers and of the padding condenser.

Calibrated Dials.

When the receiver dial is calibrated with station names, or in terms of frequency and/or wavelength, the same general procedure should be followed, aligning first the trimmers and then the padding condenser.

With the padding condenser adjusted, the receiver is tuned to a station at the low-frequency end of the band (e.g., 2FC or 3AR on 610 and 620 Kc/s respectively) and the dial pointer set to its calibrated position. A local station on about 1300 Kc/s is then brought to its calibrated position by means of the oscillator trimmer. The aerial and R.F. trimmers must then be readjusted using the modulated oscillator. Then, providing the dial is calibrated to the particular gang condenser and coil kit used the remaining stations should fall near their calibrated positions.

FIG. 17



The general rule therefore is to set the dial pointer by the low-frequency stations and adjust the positions of the high-frequency stations to coincide with their dial calibrations by means of the trimmers.

This rule also holds in receivers where the tuned circuits are aligned inductively by means of variable iron cores. The process may be rather more tedious, however, since

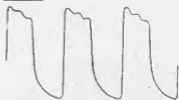
the adjustments on the high and low-frequency ends of the band are less independent.

As previously stated, the output impedance characteristic of the modulated oscillator may differ considerably from those of the average aerial, and may influence the setting of the aerial trimmer. This trimmer should accordingly be rechecked on a weak station (located at the high-frequency end of the band) with the normal aerial connected. If the receiver is fitted with a sensitive tuning indicator this operation is greatly simplified.

Short Wave Bands.

On the short wave bands, the shortcomings of service oscillators in regard to output impedance and attenuation are usually severe, and satisfactory alignment in the normal manner may be very difficult. Under such conditions, it is advisable to

FIG. 18



align the tuning circuits with the normal aerial connected, and the output lead of the oscillator twisted around it. As before, no higher input voltage should be used than is necessary to give a satisfactory reading on the output meter.

In the majority of receivers the padding condenser is of fixed capacitance and adjustment cannot readily be made for tracking. Should "dead spots" occur in the band, it may be necessary to effect a compromise in the setting of the trimmers so that more even sensitivity will be obtained across the band. Such a measure should not, however, be necessary in a well-designed receiver.

If the padding condenser is of fixed capacitance the only means of setting the dial calibration is by means of the oscillator trimmer at the high-frequency end of each band. Care must be exercised to discriminate between the signal and the "image" which may be very prominent in small receivers. (The occurrence of "images" or "second spots" was discussed at greater length in Lecture 1).

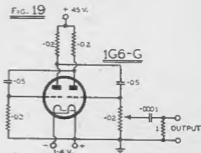
Another effect which must be appreciated is the "crossing over" effect. In the majority of receivers, the oscillator is tuned to a frequency higher than the signal frequency, the oscillator coil being slightly smaller than the aerial and R.F. coils. If, however, the range of the trimming condensers is great, it is sometimes possible at the high-frequency end of the band to tune the local oscillators to a frequency lower than that of the signal frequency circuits. Under these conditions, as the receiver is tuned across the band the resonant frequency of the aerial and R.F. Circuits decreases more rapidly than that of the oscillator circuit and a point of cross-over occurs beyond which the oscillator frequency is above the signal frequency. At the point of cross-over, i.e., where the two frequencies are equal, instability is likely to be experienced.

The reverse process can also take place when the oscillator is operated at a frequency lower than the signal input frequency.

MULTIVIBRATORS.

The multivibrator is a form of oscillator which, in addition to the usual fundamental frequency, produces also a large number of equally spaced harmonics. For this reason and also for the fact that it is simple to design and construct and hence relatively inexpensive, it is extremely useful in service work. The usual form of multi-vibrator oscillator consists of a two-stage resistance-coupled amplifier, in which the output voltage of the second valve is fed back through a resistive capacitive network to the grid of the first valve. The fundamental frequency

and hence the spacing of the harmonics is determined by the time constant of the coupling condensers and resistors. A multivibrator may be designed having a fundamental frequency of approximately 500 c/s, and producing harmonics spaced every 500 c/s to approximately 20 Mc/s (15 m.).



The high-frequency harmonics may be picked up by a normal radio receiver, but are too close to be individually separated, and constitute a continuous signal across the whole of each wave-band. After rectification, the audio-frequency components consist of the fundamental 500 cycle tone together with its audible harmonics.

Fig. 17 shows the circuit of a practical multivibrator oscillator using the twin-triode type 6F8-G. Connected as shown, the circuit produces a wave-form similar to that shown in Fig 18. The amplitude of the harmonics steadily decreases with increase of frequency although from an experimental oscillator sufficient output voltage could still be obtained at 12.5 metres to align a sensitive receiver.

The output voltage may be varied by means of the 0.05 megohm potentiometer in the output circuit, but complete attenuation can only be accomplished if the whole assembly is effectively shielded. The same general precautions are necessary as outlined in connection with modulated oscillators.

Total plate current for the two triode sections of the oscillator shown is approximately 15 milliamps.

Fig. 19 shows an alternative design using type 1G6-G operating entirely from dry batteries. The battery drain is very low, being 100 mA. for the filament and approximately 3 mA. for the plate supply.

The output on all bands is less than that given by the A.C. version, but is useful up to approximately 15 Mc/s (20 m.) above which the output falls off rapidly.

Application of Multivibrator.

As will readily be appreciated such an instrument cannot be calibrated in terms of frequency, and consequently cannot be used for aligning I.F. transformers or calibrating dials in terms of frequency. It is, however, extremely useful for aligning the tuned circuits, especially on the short wave bands.

Having once set the oscillator trimmer to a satisfactory position (at the high-frequency end of the band), the output lead of the multivibrator may be connected to, or brought near the aerial terminal of the receiver, and the signal frequency circuits then align for maximum output in the speaker.

The receiver may then be tuned to the low-frequency end of the band, and the padder adjusted for maximum output. It is unnecessary to rock the gang condenser, since with the multivibrator in operation, there is always a signal present, no matter to what frequency the receiver happens to be tuned. After adjusting the padder, the aerial and R.F. trimmers should be re-checked at the high frequency end of the band.

Another important advantage in the use of the multivibrator is that it is possible to check, quickly and easily, each wave-band in a receiver for dead-spots or variations in sensitivity by the simple expedient of listening to the output from the multivibrator, as the receiver is tuned across each band. The output from the multivibrator falls gradually with rising frequency, but does not vary greatly from point to point.

FINIS.

A.O.C.P. CLASS.

The Victorian Division are still conducting classes for those desirous of obtaining their A.O.C.P. in readiness for the time when we get back on the air again. All interested are invited to get into touch with the class manager, Mr. W. F. Sievers, 26 Lesney Street, Richmond. Telephone J 2517.



Indifferent
TONE QUALITY
mars
radio enjoyment

The brilliance and tone fidelity of to-day's radio programmes may be completely marred by worn-out valves.

Studio realism, broadcast by modern stations, can be reproduced in your home only when the valves in your radio function efficiently.

To secure the full pleasure of listening, . . .

Re-valve with



**RADIOTRON
VALVES**

Sealed for your protection

Technical Editor

R. H. Cunningham (VK3ML) and his bride officiate at Wedding Reception.



(Block by courtesy "Argus," Melbourne).

The wedding of Bob Cunningham was celebrated at "Grosvenor," Queen's Road, Melbourne, after a ceremony at The Melbourne Church of England Grammar School Chapel. VK3ML is now serving with the Royal Australian Air Force with the rank of Flight-Lieutenant at R.A.A.F. Headquarters, Melbourne.

His wife is beautiful enough to take Bob's mind off both R.A.A.F. and "Amateur Radio." We wish them all the best for their future happiness, and trust that she will inspire him to greater efforts in the production of technical articles.

ROYAL AUSTRALIAN AIR FORCE

VACANCIES FOR MEN WITH WIRELESS OR ELECTRICAL QUALIFICATIONS.

Apply to your nearest Recruiting Centre for details of enlistment as:—

(1) **WIRELESS OPERATORS (For Training)**

FOR MEN WITH A SOUND EDUCATION AND WITH OR
WITHOUT ABILITY IN MORSE CODE.

(2) **AIRCRAFT ELECTRICIANS (For Training)**

FOR MEN WITH GARAGE OR OTHER TECHNICAL
EXPERIENCE.

INSTRUCTORS WANTED

Applications will be received from men for the following Civilian positions:—

(a) **MORSE INSTRUCTORS (Civilian)**

FROM EXPERIENCED TELEGRAPHISTS.

(b) **RADIO THEORY INSTRUCTORS (Civilian)**

FROM MEN WITH A SOUND KNOWLEDGE OF RADIO
PRINCIPLES AND WITH EXPERIENCE IN HANDLING TRANS-
MITTERS.

Full Details may be obtained on application to:—

THE SECRETARY,

Air Board, Victoria Barracks,

Melbourne, S.C.I.

A Review of Radio Receivers

By courtesy Amalgamated Wireless Valve Company Pty. Ltd.

(Continued from December Issue).

(D) POWER OUTPUT STAGE.—

In this stage of a receiver, power output is of much greater importance than high voltage-amplification, so that in the design of power valves the latter is usually sacrificed in order to obtain increased handling capability.

In most radio receivers, the power output stage consists of a single power valve operating under Class A1 conditions. In an ideal Class A1 amplifier, the excursion of grid voltage is never such that the grid becomes positive with respect to the cathode, or more negative than the cut-off bias, while the wave-form of the output voltage is an exact reproduction of that of the input voltage. Moreover, the average D.C. plate current is constant between zero and full power output. In practice, the plate current may vary slightly under normal operating conditions, while some distortion is always present. The latter is, however, inaudible below certain limits.

With a normal triode output valve, the distortion with a resistive load is chiefly second harmonic. It is, therefore, usual to recommend operating conditions which give the maximum power output for 5% second harmonic distortion, since it is usually agreed that this is the smallest percentage which can be detected by ear, although with some types of reproduction very much higher percentages can be tolerated.

If the operating plate voltage and maximum grid voltage are maintained constant to the recommended conditions and the plate load resistance is increased, it will be found that both the power output and the distortion will decrease. The plate efficiency of a triode (i.e., the ratio of optimum audio power output to D.C. power input) is relatively low, being of the order of 20 to 25 per cent.

The plate efficiency of a pentode output valve is usually higher (approximately 30%), and for a similar power output requires less excitation than a comparable triode. For optimum power output, consistent with reasonable distortion, the load resistance is usually adjusted to give zero or a small percentage second harmonic distortion combined with about 7% third harmonic distortion.

The characteristics of a beam tetrode valve, such as type 6L6-G are such that it cannot conveniently be arranged to produce such low values of second harmonic distortion, although the percentage of third harmonic distortion is much lower than with a pentode. Type 6L6-G under typical Class A1 conditions produces approximately 10% second and 25% third harmonic distortion.

It will therefore be obvious from the above, that, even under ideal conditions, a typical pentode or tetrode valve produces at full out-

put much higher distortion than a comparable triode. In addition, it should be remembered that third and higher odd harmonics are much more distressing to the ear than second and higher even harmonics.

Both pentodes and tetrodes are alike in that they are very critical with regard to plate load resistance, and any variation from the specified values is likely to be accompanied by a sharp rise in harmonic distortion. Also, both types are characterised by a high value of plate resistance. Both these factors are very important, as will be seen from the following necessarily brief discussion of the effects on the overall performance of the loudspeaker.

The load impedance, presented by a typical dynamic loudspeaker to the plate circuit of the output valve, is vastly different from the purely resistive load which has been so far assumed. At the bass resonance of the cone, the speaker load behaves as a tuned circuit. Above and below this frequency, the nature of the load is largely reactive, and the impedance may rise to many times its stated value. Without entering into further detail, it can be stated that the effect with a triode valve is not extremely serious. As the value of the load impedance increases with rising frequency, the distortion and power output tend to be reduced, although the voltage developed across the load impedance increases slightly.

The characteristics of a pentode or tetrode, however, are such that an increase with frequency in plate load impedance reduces the power output at the fundamental frequency while the harmonic distortion increases rapidly, accompanied by the generation of high peak voltages in the plate circuit as a result of the higher plate load resistance and the lower damping by the higher valve plate resistance.

The harmonic distortion produced gives to the reproduction an apparent "brilliance," which may at times be very distressing to the ear. In receivers having pentode or tetrode output stages, it is therefore usual to fit some form of "tone control" to restrict the high frequency response. Such a tone control should preferably be connected across the output transformer, where, in addition to achieving the required treble attenuation, it reduces to safe values the peak plate voltages developed.

An important characteristic of a loudspeaker is the resilience of the cone, as a result of which the cone once having received an impulse continues to vibrate for an appreciable period of time when the driving force is removed. This effect is most marked at the "bass resonant frequency." The nett result is that transients lose their clarity, and the reproduction of sounds involving them becomes very unnatural.

A triode output valve, having a comparatively low value of plate resistance, tends to damp this free oscillation of the speaker cone much more effectively than a pentode or tetrode, which have much higher plate resistances.

Comparatively recent investigation has shown that it is possible, by employing the principle of negative feedback, to obtain from a pentode output valve, performance comparable to that of a triode both with regard to low harmonic distortion and speaker damping, while retaining at the same time the high plate efficiency which is characteristic of such valves. Space will not permit further discussion of this very important subject, and for further information it is suggested that the reader refer to the numerous articles which have appeared in *Radiotronics* and elsewhere.

Putting The Vacuum Tube Voltmeter into Service

In all equipment associated with or including vacuum tubes of any kind whatsoever, resonant and other types of high impedance circuits are always found. Such circuits must be used in order to obtain sufficient amplification from the tubes, which are in themselves high resistance devices. The impedance for instance of an r.f. circuit such as is used in the first and second stage of a receiver may be as high as 2 or 3 megohms when tuned to resonance with an incoming signal.

To make any measurements of potential across such a circuit it is obvious that a meter having a resistance as high as 3 or 4 megohms would be required as a lower meter resistance placed across a circuit might change the potential conditions as much as 50%. About the only connection that can be made across a circuit of this type without upsetting the circuit potentials would be that of another vacuum tube, the connection being made across the grid and cathode of said tube.

A properly designed vacuum tube voltmeter will enable the serviceman to take direct measurements on gain per stage on receivers to check the operation of the oscillator tube in superheterodyne models and to locate trouble in automatic volume control circuits. For uses such as these the instrument will be found practically indispensable as readings on such circuits cannot be obtained without equipment of this type.

The vacuum tube voltmeter is, as the name implies, nothing more than a vacuum tube connected through a meter in its plate circuit to a suitable power supply. The grid and cathode of the tube are connected across the circuit to be measured, the potential across said circuit causing a change in grid voltage on the tube and thus, a resultant change in plate current is indicated on the instrument. As the impedance from grid to cathode of the tube is practically infinite, no load whatsoever is placed on the circuit and under normal conditions

the potential will not be altered in any way.

As the vacuum tube is also a rectifier, potentials of any frequency placed across the grid and cathode of the vacuum tube voltmeter will result in a direct current deflection on the instrument in the plate circuit. For this reason the vacuum tube voltmeter can be used for measuring audio as well as radio frequency potentials provided the circuit is worked out correctly to cover this broad range of frequency.

Because any given vacuum tube is considerably limited as to the range of potentials, which may be applied to its grid circuit the overall direct range of a vacuum tube voltmeter is restricted as compared to a standard a.c. or d.c. voltmeter as such. Further, the scale of a vacuum tube voltmeter is not uniform throughout its entire operating range. These two reasons make it essential that the vacuum tube voltmeter selected by the serviceman have a number of ranges so that accurate readings may be made over the entire range of the device.

A satisfactory vacuum tube voltmeter for modern servicing should read as low as .5 volt and as high as 15 volts in order that measurements may be made of gain per stage and overall gain in an amplifier (or higher using multipliers).

Because of the characteristics of the vacuum tube and of the vacuum tube voltmeter circuit, it is necessary to have several arcs on the scale of the indicating instrument because the several ranges will not track accurately on a common arc.

Since the vacuum tube voltmeter requires an appreciable amount of power to drive it and since it is rarely used by the serviceman in the field, most satisfactory equipment will be that which is operated from the lighting circuit provided that the design of the equipment is such as to eliminate the effect of line voltage fluctuations.

(To be continued).

Federal and Victorian QSL Bureau

R. E. Jones, VK3RJ, Federal QSL Manager.

Writing from Mozambique, CR7BC, Manuel Pereira da Silva, Caixa Postal, 812, Lourenco Marques, requests me to endeavour to extract a card from the following VK stations to whom CR7BC has already sent his card:—VK2VN, JX, ADV, HV, JU, VK3LP, VK4SD, VK6NL, 6MU. What about it fellows?

Another good one for the stamp collectors. CE3BF, Roberto Wood, Box 366, Santiago, Chile, is a rabid collector, wanting to exchange.

All licences of French amateurs and those in the French Colonies have been suspended for the duration, likewise those in British possessions, while in Great Britain, licenses have been cancelled. Additional countries off the air are Latvia, Sweden, Esthonia, Italy, U.S.S.R., Germany, Jugoslavia, Cuba, Netherlands East Indies and the Belgian Congo.

Lists of cards on hand at the Bureau will not be published until licenses are restored and things get under way again. The last list was published in the January issue of "Amateur Radio."

An interesting visitor to Melbourne during January was Jim Hillhouse, VK4ZO, of Collinsville, Queensland. Jim looked in fine fettle, and enjoyed the splendid weather which this State turned on in his honor.

Philatelic hams desiring an exchange contact in U.S.A., should contact W2GW, Walt Bostwick, 1334 Putnam Ave, Plainfield, N.J., U.S.A.

On the unimpeachable authority of Snow Campbell, VK3MR, we learn that the marriage of Buck Bachelor, VK7JB, with Joy Crowder, VK7YL, took place during January. Snow hoped to be an interested spectator of the event.

Overseas ham publications are feeling the strain of finding items of interest while their subscribers are temporarily closed down. Most of the journals have shrunk to a shadow of their original size, one exception being "R.C.A.," the official journal of the Argentine Radio Club, whose November issue was one of 100 pages, especially enlarged to celebrate the anniversary of the foundation of the club.

CONTEST NOTES.

R. E. Jones, VK3RJ, Federal Contest Manager.

VK-ZL 80 METRE PHONE CONTEST.

Comment by NZART, Contest Manager.

From the list of scores (published in "Amateur Radio," January, 1940) it will be seen that the awards go to VK2NY and VK2AJK, while the N.Z. award will go to ZL2GX. As no entries were received from N.Z. in the Limited Section, it naturally follows that no N.Z. award can be made in this section. The general average of neatness in the preparation of logs was very good, two logs in particular standing out in this respect, these being those of VK2OE and VK2HZ. It is a pity all competitors did not read as far as Rule 14, which stated that all entries in the transmitting section were to state whether for the "Limited" or "Unlimited" section. Compliance with this rule would have saved much trouble in sorting out the entries. More entries could have been received, especially from those stations whose calls appear frequently in the logs of competitors. It is evident that several stations participated, but neglected to submit logs. The performance of the winner of the unlimited section was almost rivalled by the runner up, only 10 points behind. Another ZL contact would have reversed the positions.

28-56 MC Notes

Another month has passed, and believe me, these notes are becoming increasingly difficult to write since information has dropped to zero level these last couple of issues. Perhaps some of the fellows have gathered sufficient sixpences from the Xmas puddings to start the new receiver; if so, I would be pleased if they could post along the dope, or perhaps they haven't got over that extra helping—anyway, here's hoping. Ten metres has been very dead this last week and only shows life during the early mornings and until 9 a.m. Of the few stations, apart from the usual W's showing up at present, the following give some variety: J3FX, KA1LZ, KA1AP, KA1ER, XU8AM, best around noon, HC1JB qso'd by many K6's. W9YHQ is a portable operating near Honolulu and has fair signals. The majority of K6's come through as usual; evidently that distance seems to be the limit for best signals. 112 mc has been keeping the lads' interest at the last couple of KP meetings and I have been getting ideas for antenna systems which we may yet be able to put into practice. Unfortunately, living in the city, we can't try out some of those nice big Rhombics or Vee beams that take the eye, such as are described in some of the Yankee mags; still, if we get on 112 mc. it will be a different story. Just think of it, 8 ft. 6 in. is a full wave on 2½ metres. The following figures will show what would be possible. The Vee beam has a different angle between the two wires at the feeder end depending on the number of waves in each leg, and 110 degrees is the angle for one wave on each leg, 70 degrees for 2 waves, 60 degrees for 3 waves, 52 degrees for 4 waves, 45 degrees for 5 waves, and when you remember that a five wave on each leg Vee beam is just about 40 feet long over all, it shows what can be done. Tuned feeders are probably the easiest to match with such an antenna. The Rhombic or diamond even takes our thoughts.

Remembering that 8 ft. 6 in. is a full wave, a rotary diamond with a full wave on each leg is even possible. The following figures for the angle at the feeder and terminated ends are, 120 degrees for a 1 wave on each leg size, 80 degrees for 2 waves, 66 degrees for 3 waves, 56 degrees for 4 waves, and 50 degrees for 5 waves on each leg. The last named is only 46 ft. 6 in. on each leg, which makes the antenna app. 78 ft. long by 36 ft. wide. The terminating resistor is usually near the value of the surge impedance of the feeder line and must be used if best results are to be obtained. When the three element beams are considered, the small size is obvious and a real signal squirter is possible. In the States they are finding that 112 mc. will do practically all that 56 mc. will do, and a record has just been put up for a long distance contact by W9WYX and W9VTK. After several local contacts of 20 miles or so, a contact of 105 miles was obtained, using ½ wave doublets fed by lamp flex, but the results indicated a more satisfactory contact with better antennae; consequently 3 element beams were made to be followed by a trip with the portable gear; W9WYX, at Genoa, from a 60 feet look-out tower, and W9VTK, at Mount Evans (14,460 ft. high). The first call gave results and an r3 sig was brought up to r9 with a few adjustments, giving a perfect 2 hour contact, over an air line distance better than 120 miles. W9WYX used a rig having 6L6 co, 807, 809 and HK24PP final, all powered from a gas driven generator installed in a Chev. truck. W9VTK used a 42 co. 6V6g, 807 combination a Vibrapack power. Results like this certainly make 112 mc. attractive.

(We are still trying and still hoping that we will be able to try out these new frequencies at an early date.—Editor.).

Divisional Notes

IMPORTANT.

To ensure insertion all copy must be in the hands of the Editor not later than the 18th of the month preceeding publication.

N.S.W. DIVISION NOTES.

At the December General Meeting, which was held a week earlier than usual, because of the nearness of Xmas, we had two visitors of note. They were Laurie Williams, VK9WL, and Bruce Chapman, VR4BA.

During the general business part of the meeting the Secretary announced that owing to ill-health, one of our Vice-Presidents, Mr. F. Carruthers, had been forced to resign from the Council. Fred's friends the whole State over will be sorry to learn that Fred has suffered a nervous breakdown, and will not be able to take an active part in the affairs of the Institute for a long time to come. In addition, Fred has been advised by his medical adviser that he should give up all his interests elsewhere, too. A motion was moved by Mr. M. Meyers that a letter be sent to Mr. Carruthers expressing the regret of all members present at hearing of his breakdown. Mr. Meyers said that losing Mr. Carruthers would be a great loss to the Institute, because he had worked with Fred on the Council himself, and knew just what a tower of strength he was and how hard he worked for the Institute.

Mr. Ross Trehearne spoke on the activities of American Amateur Stations on the U.H.F.'s, and mentioned some of the new technique which was finding favour amongst the experimenters over in the States, and how they were paying a great deal of attention to the tank tuning condenser. Mr. Trehearne stressed the fact that it was very necessary for the boys out here to keep up with modern trends, and that he intended to point out any outstanding developments that may take place in the future, and where to find the articles on them.

An interesting talk on Ham Radio in New Guinea, and some facts about the country itself, was given by Laurie Williams. Laurie had some photographs which proved very interesting, especially the one which showed a boat almost covered with pumice powder in the Rabaul Harbour.

Laurie spoke about receiving conditions, and mentioned the fact that communication on any of the bands higher than 40 mx. was quite impossible, and even 40 mx. itself was no good sometimes. He also spoke of the great distances between stations, and how they used to hold meetings of the New Guinea Amateur Radio League via 40 mx. on a common frequency. The New Guinea Amateur Radio League is a body affiliated with the W.I.A., and has over twenty members scattered all over New Guinea and Papua. Mr. Williams is its president.

Then Bruce Chapman told us about Ham Radio in the Solomon Islands. Bruce spoke of the trouble that one went to to get on the air with any power at all, and how he and VR4AD, his nearest Ham neighbour, fared in the VK-ZL Dx Test of 1938. It is worthwhile noting that Bruce won the Junior Section of the 1938 VK-ZL Dx Test with a power input of only 12 watts to the last stage. Bruce had the highest score for any station outside New Zealand and Australia.

An interesting discussion took place afterwards on the differences in climates, conditions and cordials (?) in New Guinea and the Solomon Islands and Sydney. We learnt, amongst other things from Laurie, that the people up in Salamaua won't drink any liquor of Sydney origin, and that the only good beer comes from VIM. (We are given to understand that all beer is good.—Ed.)

Mr. Meyers conveyed to those present the season's greetings from all the boys at Richmond. He told us that there are about 40 Hams up there now. Reciprocal greetings were given to Mr. Meyers to be passed on to all the boys at Richmond. Morry says we won't recognise 2HZ when we see him again.

By the way, Snow, if you happen to read my notes, Morry thinks it is about time you cut out all those disparaging remarks you keep passing about him and the job of traffic manager. You should talk, you old buzzard.

A new member, Mr. G. Cottel, was present at the meeting.

However, if you want to see some real good gear when you come to Sydney, call in and see the wonderful range of accessories that Mr. Long, of United Radio Distributors, has brought back with him from the States. Those "Sky Riders" will make you impatient to have a go at handling them on the air, and that recording outfit is a real snifter. All the best till next time. —73 Jack.

WAVERLEY CLUB NOTES.

I think it was Bobby Burns who wrote about "seeing ourselves as others see us." When Jack Howes brought a portable recording unit to the club several weeks ago, the members had an opportunity to hear themselves as others hear them. The result was astounding. All members were agreed on the fact that they were unable to recognise their own voices, although they could recognise those of others. Several items were executed (murdered) by the Club "quartet," and on the whole a most enjoyable evening resulted.

Jack Howes once more entertained the members when he brought along his projector to the Club. Several fine films, supplied by the Shell Oil Company, provided an excellent night's entertainment.

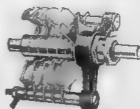
Half yearly election of officers took place on December 12. Leo. Walters remains President, Jack Howes will continue as a very able secretary, and Eric Johnson fills the position of treasurer, a position which

FOR...

RECEIVER EFFICIENCY—

FIT EDDYSTONE MICRODENSERS AND ENSURE SATISFACTION

EDDYSTONE



Famous Microdensers

- 1. Brass construction throughout with DL-9 high frequency insulation.
- 2. Both stator and rotor sections soldered to ensure low series resistance.
- 3. Every vane and whole condenser lacquered to prevent oxidation and consequent H. F. losses.
- 4. Will not change capacity constants due to oxidation after years of use, or change in efficiency.
- 5. Long spindle bearing, absolutely noiseless on highest frequencies.
- 6. No losses of any sort are measurable when a microdenser is put in circuit with the most efficient coil procurable.

No. 1094—3-18 M.MFD. Price, 6/9

No. 1129—4-40 M.MFD. Price, 7/-

No. 1130—4.5-100 M.MFD. Price, 8/-

No. 1131—5-160 M.MFD. Price, 12/9

IT PAYS TO BUY THE BEST. YOUR DEALER CAN SUPPLY.

BRISBANE: Chandlers Pty. Ltd.
MELBOURNE: P. & L. Wireless Pty. Ltd.
ADELAIDE: Gerard & Goodman Ltd.

SYDNEY: United Radio Distributors Pty. Ltd.
PERTH: Carlyle & Company.
HOBART and LAUNCESTON: W. & G. Genders Pty. Ltd.

experience has shown him to be capable of filling very efficiently.

I will now conclude, hoping to see some new faces in the New Year, at the Club-rooms, "Almont," 13 Macpherson Street, Waverley.

VIC. DIV. COUNTRY NOTES.

By 3YW.

I note in January "A.R." the fact that country hams had been naughty and not sent in any scandal, and worse and worse, 3BM either must have joined the army; been too busy getting the crop in; or just plain forgot the mag. this month, anyhow.

Since arriving in Stawell, I find I'm the town's only ham. What a pleasure the B.C.L.'s have missed! However, there is another laddie who rejoices under the name of Waite, who only has code to click on, and he will be A.O.P.C. and all ready to clutter up the B.C. programmes when our aged fingers start pounding the brass again. As for myself, I am busy planning a new RX, a double det. super plus noise silencer in the I.F. stages, so it will keep me out of mischief for many moons to come, then perhaps we might look at the possibilities of loop aerials, which I think the newer hams would find surprising. I remember building one for a FD and getting W's very nicely on the old "det. and audio," so with a super they should be very fb at present. I do most of my listening on the 36 metre ship band and thereabouts, and one night on that band will show you that hams are not the only ones who call by the hour.

3XB, of beam aerial and battery fame, located at Rupanyup, is also building a new rx, a super this time. I tried to plant the seeds of discontent 12 months ago, but no, he still stuck to the old T.R.F. (an fb one at that), but the bug must have bit anyway. Ivor is putting things together and soon will have an fb battery rx. That might sound funny, but XB is about five miles from the nearest power point, so batteries are necessary. Anyway, he does not have to worry about line noises, hi.

NORTHERN ZONE NOTES.

By VK3BM.

Letters have been received from 3ZK, 3YW, 3MR, 3IR, and Chas. Stanford, 3NN's second Op., for which many thanks.

3ZK reports that he and 3EC are having CW practice together, and if the war lasts long enough, will qualify at 16 per! Jim is complimentary about improving "Amateur Radio," and is eager to try 5 Mx., if the ban is lifted.

3EC is building a yacht and fitting his truck in readiness for holiday trip gold digging at Mt. Tarrangower.

3YW has moved to Stawell, A.C. laid on and no T.X. to pump it into, is experimenting with double IF and noise silencing in the Super.

3OR has had a fortnight's leave to attend affairs at home, but is now back at Signals Office. Other hams there are 3OW, 3HG, 3KR, 3YM, 3JM, 3BG, 3VQ, 3KJ, 5FL, and several others whose calls I can not remember.

3TL has just received an FB variable freq. Bliley rock' from U.S.A. Treb. is an officer of considerable experience and has again offered his services.

3JG has designed and is building a super Moth class yacht to be sailed on Lake Boga. The designing is nearly as difficult as that of a good Ham super het.

3QZ has also joined the Lake Boga Yacht Club.

Chas. Stanford, well-known over 3NN's mike, has enlisted in the Signals. He had just graduated from a radio college course, and has landed an FB job with the Military on radio maintenance. His brother, Alex., is also there.

3MR has sat for his 1st class ticket. Rumor has it that the 12 w.p.m. stumped him.

Letter received from 3CE. Roy has completed a nice harvest. He had an FB 100 foot lattice mast ready to erect in September. It is still on the ground. Has built the popular 3 tube super with FB results. He was called up by the R.A.A.F. W.R., but obtained leave to take off his harvest; is now awaiting further developments.

Verne Berrett, often heard from 3ZK, has recently been making his reputation as a swimmer.

3QZ and 3BM have done quite a bit of successful public address, using 3BM's former 80 watt modulator and a swag of high fidelity speakers.

3KR was recently home on leave. He likes his job at the Sigs. office. Rumor has reached here that 3OR's flst, always good, has become the pride of that same office!

NOTES.

By VK3MR.

This enforced inactivity is leaving a trail of rack and panel (sorry, ruin) behind it, the latest victim being 3RJ, our QSL manager, who finds time hanging heavily on his hands, so that even increased work in the garden can not fill that empty space. Similar tales are reaching us every day. 3XB, of QRP fame, is feeling the strain also, as he idly gazes at his Vee beams and sighs heavily. Ivan has worked PK6XX and YS2LR on 7 mc., which is rather unusual. How they hear these stations on 40 mx, beats me! 3QB, who has never worked on 20 mx, has worked 50 countries on 7 mc.; on low power, too. Good work, Jack. These notes are being written in VK7, where a deep silence has fallen. It is my pleasure to mention that two of the most active stations in Tasmania have commenced a life QSO. Bill Bachelor and Joy Crowder were married on Monday, 15th January. This was a real radio romance, which has ended so happily. The wedding breakfast was conducted with a definite radio flavour and many and

varied were the CQS and complimentary remarks passed by the hams present, via knives and forks balanced on china and used as keys! We trust that there QSO will be R9 and no QRM. While wearily wandering around Hobart, I came across Jim Anderson, who had his call 3LM issued to him just before the close down—What a blow.

Those looking for some reliable frequency checks are advised to listen for W.W.V. running 20 k.w. on Tuesday, Wednesday and Friday on the following times and frequencies: Noon to 1.30 p.m. on 10,000 k.c.; 20,000 k.c. at 2 p.m. to 3.30 p.m. E.S.T. American time. 1000 cycle modulation is used and the accuracy is better than 1 part in 5,000,000.

KEY SECTION NOTES.

By VK3CX.

The January K.P.S. meeting was held on the 16th, being this late due to the holiday season. The attendance was not as large as was expected, but with R.J. in the chair, the meeting got under way after all the lads had to climb up six flights of stairs due to the lift refusing to

PHONE B 4148



Mann Printing Co

COMMERCIAL AND
ART PRINTERS

98-100 HARRINGTON STREET, SYDNEY

*Specialise in the Printing of . . .*

QSL CARDS

which are Distinctive and Attractive

work. If this goes on much longer, I'm in favor of shifting the Club-rooms to some ground-floor joint.

The Minister of Propagation — sorry — Propaganda, has announced the engagement of R.X. at last. Cedric is definitely off the air now, boys, but we all join in wishing the happy couple all the best.

CX and OM went swimming recently and ran into JB who was similarly engaged. RN spent his Xmas touring, going through Ballarat and Ararat, where he called on SE and GN. He reports a good trip, but UM is still gradually recovering from his Christmas Carols, namely War, Wine and Women. We haven't seen much of this war stuff, but we know plenty about the other two.

XJ is an ardent listener on the S.W.—B.C. bands, and in between gets rid of the weeds in his garden. He says that he now has the best garden in the district — thanks to Adolf!

WU says that unlike XJ his garden is the worst in the district as he is run off his legs servicing BC sets, and in the spare moments he doesn't get he reads Radio and looks forlornly at the remains of his rig.

TE is now interested in portable receivers, but still finds time to listen on ham bands, and UR listens to overseas BC stuff with some code practice to keep his hand in, while CO has given up ham radio and is busy increasing his speed in the R.A.A.F.

SG is interested in the alleged "discovery" of Cathode Modulation in U.S.A.—he says "evidently Australia doesn't count."

QV still talks about erecting 10 element rotary beams, and JO reports that the magazine is still being posted (we thought that it was being delivered personally), and that the gear has gathered much dust. CP has been testing "Unity—no that's not a girl—Coupling" between RF and 1st det. and sez it's the goods. HK is still busy on his receiver, and is using an oscilloscope with freq. modulated oscillator for lining up the I.F. stages and getting selectivity response curve on the screen.

UE has just returned from a four weeks' vacation in Sydney—has pulled down his antenna and erected a b.c. antenna for reception of war news.

The next K.P.S. meeting will be held on February 6th, so if you get

the magazine before that date, don't forget to turn up, as a most enjoyable evening is assured.

VK4 NOTES.

By VK4ZU.

Well, the poor attendance at the last General Meeting doesn't give a chap much incentive to write these notes, but we must keep the old flag flying. In case some of you are still unaware of the change of rooms, I will repeat 4AW's remarks of last month. The meetings will in future be held in the rooms of the Diggers' Association, Essex House, Adelaide St., opposite Anzac Square, Brisbane. The meetings are held on the last Thursday in each month.

We had the pleasure of hearing a very fb lecture by 4HR entitled "Studio Control Technique." Tibby pointed out a host of features employed in B.C. stations design, features well applicable to Ham Radio. (What about this article for "A.R." Ed. Have it put into print. We need it and how).

However, it's not very encouraging giving lectures to a mere handful of enthusiasts, so don't forget to roll along to the meetings, chaps. If it would help at all, I would like to point out that there are about a dozen rather luxurious arm chairs for our exclusive use, but it's a case of first come first served, so it's up to you, Hi.

WHO'S WHO.

4RT—John very busy these days. The faster the grass grows the more he likes it. I don't know, some people do have queer ideas. As far as I am concerned, it needn't grow at all.

4HU Just made one of his periodical flying visits to Brisbane. No, George doesn't use an aeroplane, it's done in a Vauxhall.

4LT—Still in camp. Had this scribe for a cobbler until recently, but is now Ham Radio's sole representative in the camp in question. Albert is Brass Pounding.

4JP—George been taking photographs of some local shacks.

4ES—Now I would say that Herb. has used his head. He goes and gets married, so that by the time we get back to CQ, 73, etc., he will be nicely settled down. Good work, OM, and congrats.

4RY—Bills the man who sees that you receive your copy of the Mag.

Don't let the old and ancient game get you down, Bill. Anyway, I bet you can lick 4AW any time.

4SN—Well, it's a pity all you country chaps don't drop us a line as often as Frank does. How does the new 8JK pan out for reception, OM?

4KS—Keith, as mentioned recently, is a member of R.A.A.F. Reserve. Saw you at Kelvin Grove Signal Drill Hall some time ago, but just couldn't just catch your eye.

4KF—Suppose you are having a spell from work for a time, Keith. I take it that your pupils have a long Xmas vacation.

4OK—Finished that new shack yet, Jack? One of our local Hams, 4FL, I think it was, had plans well under way for a really classy model, complete with air conditioning, lounge chairs, etc., but I never heard whether it was completed. Wat say, Frank?

4RC—Bob has taken up Table Tennis, so I hear. How about all you fellows letting us know what you do with yourselves these days. Have fallen rather deeply into the clutches of Photography myself.

4KH was staggered the other day

to hear that Bill has another super. on the way. How about an article for "A.R." Bill? You could title it "The First Twenty Supers. are the Worst." HI.

Well, I would like to devote a bit of space to our Country Members now, but it's very hard to compile notes from nothing. Was Mark 4XO the only one who could write notes for the Bundaberg Zone? Also, how about some dope from the Rockhampton Radio Experimenters' Association. Phew! What a mouthful! Cheerio till next month.

S.A. DIVISION NOTES.

By VK5RN.

December and January have been fairly uneventful months, as no meetings were held over the Xmas and the New Year holidays. Code practice classes have been resumed, however, and these take place every Wednesday, and not twice weekly as was previously the case.

Our President, VK5JT, has been very busy moving from his old Q.R.A., as he has taken over the Coronation Hotel, where he has al-



The Power Equipment with a Powerful Reputation . . .

THE Organisation responsible for the
production of . . .

HILCO TRANSFORMERS

CHOKES, etc.

has proved its high standards for an article
of extreme merit as accepted by the
largest consumers in Australia.

**ALL PRODUCTS GUARANTEED FOR
TWELVE MONTHS.**

HILCO TRANSFORMERS PROPRIETARY LIMITED

97-111 BERKLEY ST., CARLTON, N.3., Vic. 'Phones; F1661-2
CABLES & TELEGRAMS: "HILCOY," MELBOURNE.

ready decided to hold a special meeting when the ban is lifted. We wish Joe the best of luck with his new enterprise.

Our Xmas meeting consisted largely of a Post Mortem on the second class commercial exam., which several of our members took early in December. The results are not yet out, but they are just about due now, and it shouldn't be long before they are known.

We have heard nothing from the country gang since the war started, except that Frank (5BF) is contemplating building a new receiver after the style of the H.Q. 120X, having sold his old set—so what about a note from some of you, to let us know what's happening out in the "wide open spaces."

ROUND TASMANIAN RADIO SHACKS.

It was intended to write this whilst in Melbourne at Easter and forward it to the Editor of "A.R." then, but as a Y.L. upset the schemes and the writer was not then a W.I.A. member, it just did not happen.

Since we were to spend almost a month in Hobart, and as neither my pal (Fred) or I had any connections there, we decided, knowing we would have much spare time, to call on the Tasmanian Secretary and see what could be done about visiting some interesting shacks.

After our arrival on the 17th February, we finally found "Chum" Moorhouse, and told him of our objects. He agreed to co-operate, and introduced us to a couple of the boys there and then. They just happened to be in the shop at the time. A tour of the stations was arranged for Saturday the 25th, and after a short ferry trip, we arrived at Bellerive. A short walk and we were on VK 7KV's doorstep. Unfortunately our visit clashed with the Bellerive Regatta, and so Keith could not show us around himself. Keith's rig was explained by "Chum," who knew it fairly well. He had tons of room for antennae, and had erected doublets for 7 mc., 14 mc., and a vertical doublet for 56 mc., work. His transmitter consisted of a large box in which all tuning gear was located. Tubes, etc., were on top. An 800 was used in the final with an 809 immediately preceding it, quite a family of 46's were used as oscillators and doublers. We were told by "Chum" that

KV could change from 7 to 56 mc. by altering the final coil and throwing a few D.P.D.T. switches. Also present in KV's shack was one of those "Jones" stabilised oscillators for use on 56 mc. Very little was actually being done on this band, despite the gear in evidence. His receiver was a five tube superhet. of conventional design.

Next visited was 7CM, who lived about a quarter of a mile away. His transmitter was a rack mounted job capable of operation on either 7 or 14 mcs., 'phone or CW'. He used an E.C.O. quite a bit and didn't always hit the band! (I heard him around 6.7 mcs. one night). Still, I suppose this has been cleared up by now. Going into C.M.'s shack one was likely to get caught in the maze of wires present—sort of "Come into my parlour," said the spider to the fly. Despite the haywire appearance, this ham worked some fine DX. Keying was done by a bug made from scraps of brass and aluminium.

The next on our programme was 7KQ, chief engineer of broadcasting station 7HT. He only uses a low power rig on 7 mcs., and his main interest then was rag-chewing with fellow-broadcast engineers in Melbourne. The final was a 6L6G grid modulated for 'phone by a small "P"-based Phillips pentode driven from a condenser mike and pre-amplifier. The condenser mike used was fitted into the front of the pre-amplifier, and was a particularly good job constructed by the owner. Antennae used were Zepp fed doublet on 7 mc, and Jones' "all band" for reception. On 56 mcs., a vertical doublet indoors and a half wave with quarter wave matching stub, and twisted feeder approximately 100 ft. long outdoors. Some portable equipment had been constructed for a 56 mc. DX test from the "Pinnacle" of Mount Wellington to Victoria on Sunday, Feb. 26. The gear was capable of either 'phone or I.C.W. transmission. Receiver was a very small four valve R.C. superhet. A M.O.P.A. transmitter for 56 mcs. then under construction and was to be used in conjunction with a Reinartz rotary beam at a later date.

7KQ had no room in his car for two passengers or we should have gone along with him to witness the tests. Undaunted, however, we set out on foot to see something of the country and the experiments, too.

We arrived at the Pinnacle at about 3 p.m., and wandered around in the bitter cold, it was a very dull misty day, and even rained a bit, looking for their site. This we failed to find and so we returned to Hobart. Later we heard the experiments had been unsuccessful.

The following Monday evening, March 6th, we visited Australia's first "ham," Mr. Fred Medhurst, VK7AH, ex-Post Office Engineer, and retired Captain of Signals. He told us about his first QSO with H.M.S. St. George from his station XFM, in 1901, on the occasion of the visit of the then Duke and Duchess of York. He also showed us much

of the old gear used. His home "Cranleigh" is like a radio museum, and he enjoyed showing us his treasures as much as we enjoyed listening to his tales and looking at his relics. The evening was topped off by a delicious supper served by the "Cranleigh" ladies.

Although Mr. Medhurst is not active nowadays, it is interesting to note that he was W.A.C. on 'phone, using a 201A modulated by another 201A and with about three watts input. The following Wednesday we visited him at his office in Hobart, and he showed us photos of the first "Blinking Billy" station. He gave us QSL cards as souvenirs.

On the 12th March, we visited 7YL as had been arranged and enjoyed an evening with her. She is a school-teacher at Sandy Bay and, at the time of our visit, had most of 7JB's gear and was operating on 200 metres on Sunday afternoons in lieu of him. Her transmitter consisted of 53 oscillator 46 dbler, 210 buffer and a 800 final with 40 watts input modulated by a pair of 50's operating class "A". A D2 mike was used and receiver a seven tube superhet. The antennae was a 132 ft. Zepp. fed job.

Another ham whose shack we saw was "Chum" Moorhouse, Sec. of W.I.A. in Tas. He had recently moved and rebuilding was in progress. Transmitter then ready for the air consisted of 47 osc., 46 buffer doubler, and an E406 final. The receiver then under construction was an A.W.A. "All World Eight." A long stick was also being prepared for erection. Had there been no "WAR" he would be making quite a hole in the air by now. No news of his station has, to my knowledge, appeared in "A.R.," but I noticed the W.I.A. exhibit at Launceston consisted largely of his gear.

—Sydney T. Clark.

H A M S !

**DO YOU WANT TO BE
BACK ON THE AIR?**



The Wireless Institute of Australia

is the recognised spokesman of the
AUSTRALIAN AMATEUR.

If you are not a member—

Join Now !

When the time comes that we can
reasonably expect to go back on the
air, we want to say that we represent—

EVERY ACTIVE HAM

in the Commonwealth.

Strengthen our hand by writing to The
Secretary of the Institute in your State
to-day.

All addresses are on the title page.

Correspondence Section

Iron Knob,
South Australia.

The Editor, "Amateur Radio,"

Sir,—Having lots and lots of spare time now, and being too lazy to swat my study courses, I have been admiring the collection of QSL cards on my walls, and instead of being like the ancient, who moaned past glories, I have been saying what a smart guy I am to have worked all those people.

Why should we grizzle 'cause we are temporarily squashed? I may have a different mentality to others, but I get a certain amount of satisfaction from the fact that my rig is almost intact, and barring the essentials that our P.M.G. demanded out our racks and panels, breadboards, etc., are as of old, insofar that if the call came, I'll bet 90 per cent. of Aussie's hams could be on the air within a short time. We are experimenters, and as experimenters we should know blindfolded where this and that should go, and what wire to connect, so here is one ham at least, who gets not that sinking feeling at entering the holy of holies. Anyhow look at the practice we are now able to get copying that com.

Also, Mr. Editor, what wonderful qsl's we should be able to design now we have leisure to study our wall ornaments. Look anywhere and it is "To Radio. ur RST Trans. watts rx pse qsl 73s etc." They say great minds think alike, well, hams the world over must be great minds. Out of 100 cards (my shack wall is panelled so that 100 cards fit a panel) 93 said "To Radio," the others varied slight-

ly. We all are aware that our cards are to disseminate salient facts regarding what the other chap's signal sounded like to us, and also a reminder of our gear, etc., but could we not try for a little originality in our cards; then, why, oh, why 73s. Do ye young in heart never learn, dear children, it is 73, 73! 73 is an ancient line abbreviation of "best wishes," and not best wisheses as your extra "s" conveys. I'll forgive "Vy 73" as conveying extra enthusiasm on the other chap's part, hi. I had one chap stutter out on his key my very best 73 ss! and so I sent back, after trying to explain just 73, and lo and behold, he came back with mny 73ss.

Oh, I nearly forgot, please tell them that "es" is thought NEVER written 73.

LEITH COTTON,
Still VK5LG, M.W.I.A.

AMATEUR RADIO REGISTER.

In this issue, we again enclose a register form, and we suggest that, if you do not use this yourself, you pass it on to the chap around the corner. Whether you are serving at present or not, you are requested to fill in the form and post it as directed. This is not intended to be a register of those who are serving with the various services only, but a register of all VK hams, and it is essential that everyone supply us with the information required, as it is intended to use this for further negotiations for restitution of our licenses.

HAMS

WHEN REBUILDING YOUR RECEIVER
REPLACE YOUR OLD SPEAKER WITH

AMPLION

THE NEW 12in. ELECTRICALLY WELDED
SPEAKERS

MODEL	Air Gap Flux	Weight of Magnet	POWER OUTPUT. Undistorted—Max		Diameter	PRICE
V	8,300	12 ozs.	10 watts	15 watts	12 $\frac{3}{16}$ "	£2 3 0
VL	9,000	22 ..	13 ..	20 ..	12 $\frac{3}{16}$ "	£2 16 0
VP3	12,000	64 ..	20 ..	30 ..	12 $\frac{3}{16}$ "	£5 10 0
VP2	9,000	20 ..	12 ..	18 ..	12 $\frac{3}{16}$ "	£3 6 6
VPI	7,500	14 ..	8 ..	12 ..	12 $\frac{3}{16}$ "	£2 10 0

Types V and VL are Field Type Speakers.
Types VPI, 2, 3 are Per-Magnetic Speakers.

**SILVERED
MICA**

T. C. C.

**CERAMIC
CONDENSERS**

T.C.C. Silvered Mica Condensers are guaranteed to maintain their capacity under all temperatures, thus insuring no frequency drift in Supers. The foil is actually plated on the mica.

We can supply these Condensers in any per cent. of accuracy, including 0%.

The Capacity Range is from 10 mmf to 800 mmf.

LIST PRICE, 1/- EACH.

We are Agents for—

I.R.C. RESISTERS.

T.C.C. CONDENSERS.

AMPLION SPEAKERS.

BRUNO MICROPHONES.

BIRNBACH INSULATORS.

TRIMAX TRANSFORMERS.

**AUSTRALASIAN ENGINEERING
EQUIPMENT CO. PTY. LTD.**

370 Little Collins St., Melb. Phone: F 5585

Let us quote you for your
PRINTING REQUIREMENTS



The House of Good Printing

**285-287 LATROBE STREET,
MELBOURNE, C.I**

Opposite "The Argus" Office

Telephone MU 2897 After Hours FU 6795